



FLORENCE COPPER INC.

1575 W. Hunt Highway, Florence, Arizona 85132 USA

florencecopper.com

May 21, 2019

Mr. Emmanuelle Rapicavoli
Acting Manager
U.S. Environmental Protection Agency, Region 9
Drinking Water Protection Services, WTR-3-2
75 Hawthorne Street
San Francisco, California 94105-3901

Re: Request to Reduce Over-Pumping Rate at the Florence Copper Production Test Facility

Dear Mr. Rapicavoli:

Florence Copper Inc. (Florence Copper) has been operating the Production Test Facility (PTF) in accordance with provision of Underground Injection Control Permit No. UIC R9UIC-AZ3-FY11-1 (UIC Permit) since December 2018. Part I.E.1(a) of the UIC Permit requires that Florence Copper pump the recovery wells at a minimum of 110 percent of the injection rate to ensure hydraulic control is maintained.

The PTF is a pilot test operation, and one of the objectives of the test is to determine optimum operating parameters that may be applied to create the most efficient and productive in-situ copper recovery possible at the project site. Among the parameters to be refined is the amount of over-pumping required to maintain hydraulic control. This parameter has long-term implications for the water use efficiency of the project, and the corresponding conservation of water resources, electrical power, and land required to build evaporation ponds. Consequently, Florence Copper desires to reduce the volume of required over-pumping to conserve resources, while continuing to maintain hydraulic control. Florence Copper hereby requests permission to reduce the volume of required over-pumping to 106 percent of the volume of injected fluid.

Hydraulic Control Pumping During Q1 2019

Since PTF operations began in December 2018, Florence Copper has continuously pumped greater than 110 percent of the volume of solution injected on an average basis. The actual daily average injection and pumping rates were submitted to your office on April 29, 2019. The injection and recovery tables and plots are provided as Attachment A to this letter for your convenience.

The extracted volume has consistently exceeded the injected volume. On February 6 through 9 and February 14 through 15, recovery was near the target recovery of 110 percent as Florence Copper fine-tuned flow rates to minimize over-pumping to the Process Solution Impoundment. Weekly and monthly averages were all greater than 110 percent. Hydraulic control on these dates was maintained as demonstrated in the hydraulic gradient table and plots in Attachment A. The data provided in Attachment A show that the requirement of 110 percent over-pumping set forth in Part I.E.1(a) of the UIC Permit was achieved with the exception of the few days noted above where the pumping rate dropped briefly just below 110 percent. Water levels measured during Q1 2019 show that hydraulic control was maintained throughout Q1 2019, including the brief periods of time when

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pumping dropped slightly below 110 percent. Water level data collected during Q1 2019 are listed in tabular format and are plotted on graphs included in Attachment B.

The data provided in Attachment B show that the criterion set forth in Part I.E.1(b) of the UIC Permit, requiring 1-foot of drawdown between the PTF observation and pumping wells was satisfied during Q1 2019, and that more than 1-foot of drawdown was typically observed at each well pair. This fact indicates that lower pumping rates may be used for hydraulic control while still meeting the 1-foot drawdown criterion established in Part I.E.1(b) of the UIC Permit.

Bulk electrical conductivity data collected using conductivity sensors placed on the casing of each PTF observation well collected during Q1 2019 showed that no vertical migration of injected fluids occurred, meeting the criterion set forth in Part I.E.1(c) of the UIC Permit, and confirming that hydraulic control was maintained during that period. The report summarizing the bulk electrical conductivity monitoring and analysis results is included as Attachment C.

Groundwater Model Simulations

During the application process for Significant Amendment of Aquifer Protection Permit (APP) No. P-106360 in 2015, Haley & Aldrich, Inc. conducted model simulations of various over-pumping conditions to determine the effects of different groundwater extraction rates on hydraulic control. The model simulations were conducted in terms of net extraction, where injection and recovery were assumed to balance, and only the excess hydraulic pumping was simulated. The model simulations were conducted to demonstrate that a cone of depression could be created that would satisfy the “barrier” requirements described in Section 3.4.5.3.1 of the Best Available Demonstrated Control Technology (BADCT) Mining Guidance Manual.

The highest hydraulic control extraction rate simulated was 60 gallons per minute (gpm) which represents 25 percent over-pumping relative to the 240 gpm maximum injection rate set forth in Part I.E.1(a) of the UIC Permit. The lowest hydraulic control extraction rate simulated was 7.5 gpm which represents 103 percent over-pumping relative to the maximum injection rate. The 103 percent value was simulated because that is the approximate minimum pumping differential that can be consistently maintained with conventional pumping and control equipment.

The model simulations were used to identify the maximum and minimum drawdown values simulated at the Area of Review (AOR) boundary which coincides with the APP Pollutant Management Area (PMA) boundary defined in APP No. P-106360. The model simulation results were also used to define the approximate extent of the cone of depression beyond the AOR boundary. The approximate maximum and minimum drawdown, and distance to the edge of the cone of depression beyond the PMA/AOR boundary, are tabulated in Attachment D. Model simulation results were reported for model layers 5 and 6 which represent the lowermost layer in the Lower Basin Fill Unit (LBFU) and the uppermost layer in the Bedrock Oxide unit. These layers are reported because they also represent the interaction between the LBFU and the Bedrock Oxide unit, which are in hydraulic communication.

The groundwater model simulations show that at a pumping rate of 7.5 gpm (103 percent over-pumping) the cone of depression reaches the PMA/AOR boundary within approximately 30 days and continues growing outward until the termination of the model simulation at 790 days. Based on these model results, the BADCT defined hydraulic barrier required for in-situ mining can be established and maintained at hydraulic control extraction rates as low as 103 percent over-pumping. Graphical depiction of the simulated cone of depression generated from extraction rate modeled are provided in Attachment E.

Proposed Hydraulic Control Extraction Rate

Hydraulic control monitoring data generated during Q1 2019 show that hydraulic control can be maintained consistently at the PTF well field using a pumping rate that is 110 percent of the injection rate. The data presented in Attachments A, B, and C show that requirements set forth in Part I.E.1(a), (b), and (c) of the UIC Permit were met with 110 percent over-pumping.

The drawdown data included in Attachment B indicate that more than 1-foot of drawdown was observed at 110 percent over-pumping, suggesting that a lower extraction rate may be used to maintain hydraulic control while still meeting the 1-foot drawdown requirement set forth in Part I.E.1(b) of the UIC Permit. Groundwater flow model simulations indicate that hydraulic control, as defined by the BADC Manual for in-situ mining operations, may be maintained with as little as 103 percent over-pumping.

Given these facts, Florence Copper hereby proposes to reduce the minimum over-pumping requirement to 106 percent of the injected volume and to examine hydraulic control conditions at that pumping rate. This over-pumping rate was selected because it represents a conservative stepwise reduction within the range of simulated extraction that will maintain hydraulic control. The proposed 106 percent over-pumping rate would be approximately 15 gpm relative to the maximum injection rate set forth in the UIC Permit of 240 gpm and can be consistently maintained using conventional pumping and control equipment.

If allowed to pump at a rate of 106 percent of the injection rate, Florence Copper will continue monitoring hydraulic control using the same criteria defined in the UIC Permit. If, while pumping at 106 percent of the injection rate, hydraulic control conditions set forth in the UIC permit could not be consistently achieved, Florence Copper will increase the pumping rate until each criterion could be consistently met.

The proposed reduction of the minimum over-pumping requirement set forth in Part I.E.1(a) of the UIC Permit will conserve important water resources, reduce power consumption, and in the long term may reduce the footprint of necessary evaporation ponds.

Please contact me at 520-374-3984 if you require any additional information.

Sincerely,
Florence Copper Inc.



Dan Johnson
Vice President – General Manager

Enclosures:

- Attachment A – Daily Injection and Extraction Volumes with Percent Recovery
- Attachment B – Hydraulic Gradient – Daily Average Water Level Elevations – Observation and Recovery Wells
- Attachment C – Summary of Bulk Conductivity Monitoring Results, First Quarter 2019 Memorandum dated April 26, 2019
- Attachment D – Table 3-1. Cone of Depression Barrier
- Attachment E – Figures 9-6. Cone of Depression Barrier in Model Layer 6

cc: Maribeth Greenslade, ADEQ

ATTACHMENT A

**Daily Injection and Extraction Volumes
with Percent Recovery**

Daily Injection and Extraction Volumes with Percent Recovery

Date	Daily Injection Volume (gallons)	Daily Recovery Volume (gallons)	Ratio PLS/Raff	% Recovery
1/1/2019	313,100	352,186	1.12	112
1/2/2019	246,700	332,196	1.35	135
1/3/2019	253,700	335,262	1.32	132
1/4/2019	308,700	370,921	1.20	120
1/5/2019	311,300	368,690	1.18	118
1/6/2019	311,200	368,800	1.19	119
1/7/2019	308,400	369,200	1.20	120
1/8/2019	310,900	368,700	1.19	119
1/9/2019	305,000	351,900	1.15	115
1/10/2019	297,700	353,600	1.19	119
1/11/2019	309,000	346,500	1.12	112
1/12/2019	311,300	345,900	1.11	111
1/13/2019	310,600	345,400	1.11	111
1/14/2019	310,400	344,900	1.11	111
1/15/2019	310,500	345,000	1.11	111
1/16/2019	310,500	341,700	1.10	110
1/17/2019	310,400	352,200	1.13	113
1/18/2019	310,300	351,900	1.13	113
1/19/2019	310,600	346,500	1.12	112
1/20/2019	310,100	345,000	1.11	111
1/21/2019	310,100	344,700	1.11	111
1/22/2019	310,100	344,700	1.11	111
1/23/2019	310,100	344,700	1.11	111
1/24/2019	310,200	344,500	1.11	111
1/25/2019	310,000	342,500	1.10	110
1/26/2019	310,200	340,300	1.10	110
1/27/2019	310,200	338,200	1.09	109
1/28/2019	279,700	330,100	1.18	118
1/29/2019	310,000	344,900	1.11	111
1/30/2019	309,800	344,400	1.11	111
1/31/2019	309,900	341,500	1.10	110
January Averages	304,861	348,289	1.15	115

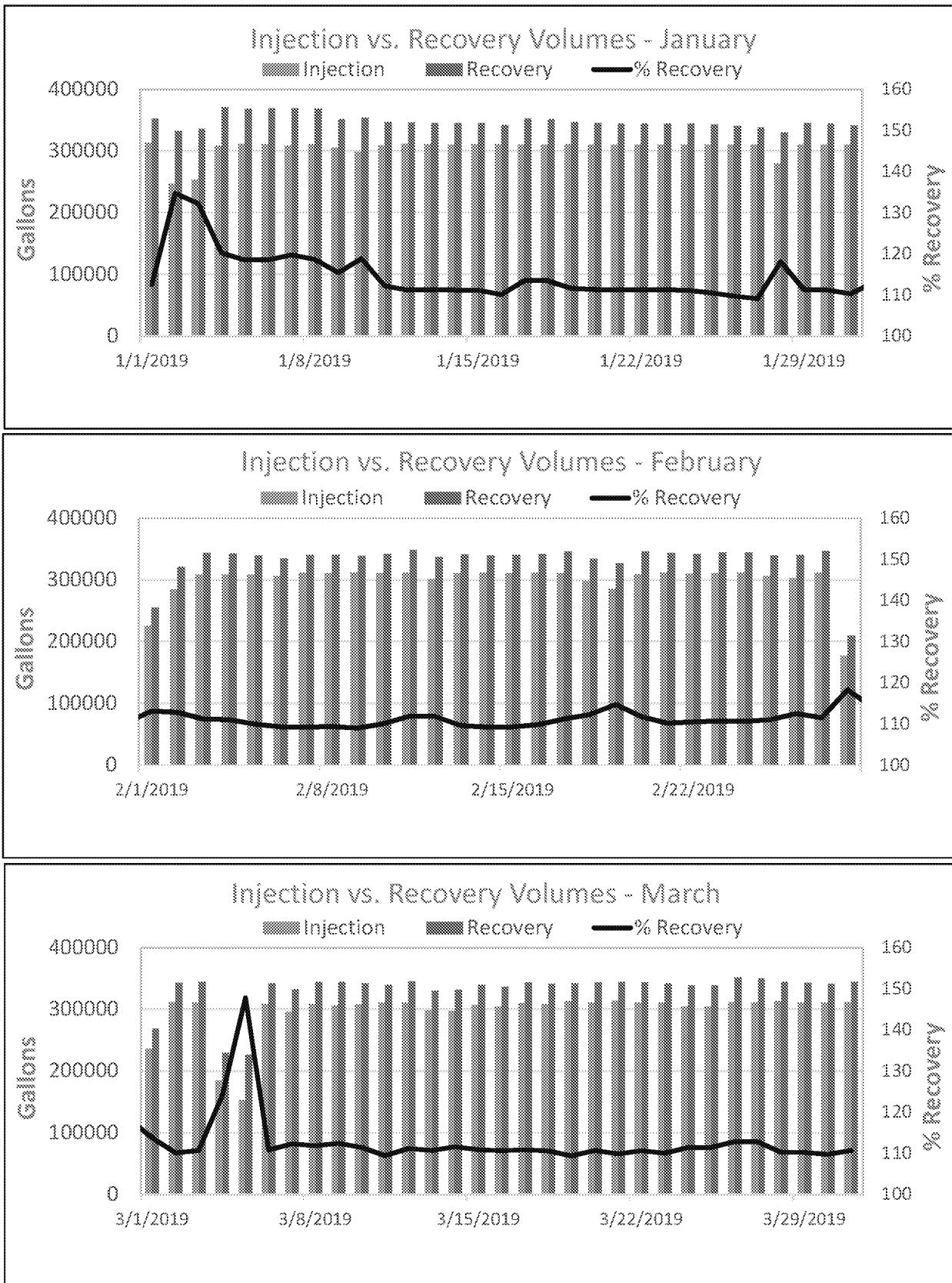
Daily Injection and Extraction Volumes with Percent Recovery

Date	Daily Injection Volume (gallons)	Daily Recovery Volume (gallons)	Ratio PLS/Raff	% Recovery
2/1/2019	225,200	254,700	1.13	113
2/2/2019	284,900	321,400	1.13	113
2/3/2019	308,800	343,400	1.11	111
2/4/2019	308,800	342,800	1.11	111
2/5/2019	308,800	339,500	1.10	110
2/6/2019	306,400	334,700	1.09	109
2/7/2019	311,400	340,100	1.09	109
2/8/2019	311,200	340,200	1.09	109
2/9/2019	311,300	339,200	1.09	109
2/10/2019	310,900	342,200	1.10	110
2/11/2019	311,300	348,200	1.12	112
2/12/2019	301,700	337,300	1.12	112
2/13/2019	311,000	340,800	1.10	110
2/14/2019	311,300	339,900	1.09	109
2/15/2019	311,200	340,000	1.09	109
2/16/2019	311,400	341,900	1.10	110
2/17/2019	311,200	345,900	1.11	111
2/18/2019	297,800	334,300	1.12	112
2/19/2019	285,000	327,000	1.15	115
2/20/2019	309,400	345,700	1.12	112
2/21/2019	311,600	343,200	1.10	110
2/22/2019	309,800	342,200	1.10	110
2/23/2019	311,100	344,300	1.11	111
2/24/2019	311,500	344,500	1.11	111
2/25/2019	305,800	339,400	1.11	111
2/26/2019	302,700	340,500	1.12	112
2/27/2019	311,300	347,000	1.11	111
2/28/2019	177,100	209,500	1.18	118
February Averages	299,639	332,493	1.11	111

Note: On Feb 06 – 09, and again on Feb 14-15 percent recovery was near 110% as Florence Copper fine-tuned flowmeters to obtain the least amount of overpumping to the Process Solution Impoundment. Weekly and monthly averages were all \geq 110%. Hydraulic control on these dates was completely maintained, as shown by the gradients in the tables below.

Daily Injection and Extraction Volumes with Percent Recovery

Date	Daily Injection Volume (gallons)	Daily Recovery Volume (gallons)	Ratio PLS/Raff	% Recovery
3/1/2019	236100	268600	1.14	114
3/2/2019	311800	343100	1.10	110
3/3/2019	311,300	344,400	1.11	111
3/4/2019	185,000	229,200	1.24	124
3/5/2019	153,100	226,300	1.48	148
3/6/2019	308,900	342,000	1.11	111
3/7/2019	296,000	332,300	1.12	112
3/8/2019	308,400	344,600	1.12	112
3/9/2019	306,600	344,500	1.12	112
3/10/2019	307,700	342,600	1.11	111
3/11/2019	310,700	339,700	1.09	109
3/12/2019	311,100	345,700	1.11	111
3/13/2019	298,300	330,000	1.11	111
3/14/2019	297,300	331,500	1.12	112
3/15/2019	306,900	340,000	1.11	111
3/16/2019	304,300	336,400	1.11	111
3/17/2019	310,100	343,600	1.11	111
3/18/2019	308,700	341,200	1.11	111
3/19/2019	313,200	342,300	1.09	109
3/20/2019	311,200	344,200	1.11	111
3/21/2019	314,000	344,700	1.10	110
3/22/2019	311,200	344,100	1.11	111
3/23/2019	311,400	342,500	1.10	110
3/24/2019	304,400	338,900	1.11	111
3/25/2019	304,400	338,900	1.11	111
3/26/2019	311,900	351,800	1.13	113
3/27/2019	311,000	350,500	1.13	113
3/28/2019	313,100	345,000	1.10	110
3/29/2019	311,300	342,900	1.10	110
3/30/2019	311,200	341,300	1.10	110
3/31/2019	311,500	344,600	1.11	111
March Averages	297,165	332,174	1.13	113



On March 4-5 injection flows were decreased and recovery flows were adjusted to maintain injection control ratios and a substantial hydraulic gradient during temperature logging of wells and routine plant maintenance.

ATTACHMENT B

**Hydraulic Gradient – Daily Average Water
Level Elevations – Observation and Recovery Wells**

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	PW-05 (R-01)	O-01	O-07	PW-06 (R-02)	O-01	O-02	PW-07 (R-03)	O-02	O-03	PW-08 (R-04)	O-03
01/01/19	1242.10	1244.48	1244.30	1242.38	1244.48	1244.41	1236.74	1244.41	1243.16	1239.21	1243.16
01/02/19	1239.48	1240.74	1241.03	1238.92	1240.74	1241.03	1234.55	1241.03	1240.25	1236.96	1240.25
01/03/19	1239.09	1241.24	1241.11	1238.90	1241.24	1241.83	1236.48	1241.83	1241.24	1237.96	1241.24
01/04/19	1241.23	1243.86	1243.68	1241.15	1243.86	1243.88	1236.55	1243.88	1242.69	1238.77	1242.69
01/05/19	1242.90	1245.57	1245.13	1242.89	1245.57	1245.70	1240.06	1245.70	1245.01	1240.87	1245.01
01/06/19	1243.52	1245.91	1245.54	1243.29	1245.91	1246.12	1240.94	1246.12	1245.52	1241.39	1245.52
01/07/19	1243.52	1245.91	1245.54	1243.29	1245.91	1246.12	1240.94	1246.12	1245.52	1241.39	1245.52
01/08/19	1243.46	1245.81	1245.69	1243.33	1245.81	1246.05	1241.10	1246.05	1245.36	1241.49	1245.36
01/09/19	1244.51	1247.31	1246.81	1244.63	1247.31	1247.73	1243.64	1247.73	1247.70	1245.38	1247.70
01/10/19	1243.81	1246.39	1246.15	1243.55	1246.39	1246.92	1243.99	1246.92	1247.12	1244.28	1247.12
01/11/19	1246.02	1248.83	1248.34	1246.25	1248.83	1249.48	1246.81	1249.48	1249.87	1246.68	1249.87
01/12/19	1246.61	1249.35	1248.85	1246.88	1249.35	1249.92	1247.36	1249.92	1250.14	1247.85	1250.14
01/13/19	1246.64	1249.45	1248.92	1246.92	1249.45	1249.96	1247.55	1249.96	1250.44	1247.97	1250.44
01/14/19	1246.67	1249.53	1248.83	1246.95	1249.53	1250.11	1247.61	1250.11	1250.54	1248.05	1250.54
01/15/19	1245.35	1248.62	1248.29	1245.71	1248.62	1249.25	1246.96	1249.25	1249.92	1247.43	1249.92
01/16/19	1244.30	1247.65	1247.30	1244.66	1247.65	1248.60	1245.99	1248.60	1248.90	1246.41	1248.90
01/17/19	1242.35	1245.61	1245.36	1242.67	1245.61	1246.36	1243.93	1246.36	1246.94	1244.28	1246.94
01/18/19	1241.68	1244.99	1244.67	1241.99	1244.99	1245.60	1243.41	1245.60	1246.26	1244.01	1246.26
01/19/19	1241.37	1244.81	1244.34	1241.78	1244.81	1245.35	1243.14	1245.35	1246.17	1243.66	1246.17
01/20/19	1241.27	1244.68	1244.39	1241.58	1244.68	1245.34	1243.05	1245.34	1246.09	1243.53	1246.09
01/21/19	1241.99	1245.28	1245.15	1242.40	1245.28	1245.97	1243.81	1245.97	1246.95	1243.91	1246.95
01/22/19	1242.39	1245.54	1245.49	1242.74	1245.54	1246.27	1244.22	1246.27	1247.12	1244.53	1247.12
01/23/19	1242.29	1245.77	1245.39	1242.66	1245.77	1246.47	1244.17	1246.47	1247.30	1244.70	1247.30
01/24/19	1242.31	1245.76	1245.35	1242.62	1245.76	1246.44	1244.15	1246.44	1247.29	1244.47	1247.29
01/25/19	1242.61	1246.11	1245.77	1243.04	1246.11	1246.84	1244.59	1246.84	1247.70	1245.03	1247.70
01/26/19	1243.11	1246.63	1246.26	1243.48	1246.63	1247.36	1245.10	1247.36	1248.27	1245.53	1248.27
01/27/19	1243.41	1246.98	1246.55	1243.86	1246.98	1247.73	1245.50	1247.73	1248.61	1245.88	1248.61
01/28/19	1242.21	1245.67	1245.43	1242.53	1245.67	1246.40	1244.13	1246.40	1247.31	1244.60	1247.31
01/29/19	1242.40	1245.87	1245.56	1242.79	1245.87	1246.66	1244.35	1246.66	1247.44	1244.67	1247.44
01/30/19	1240.37	1243.85	1243.43	1240.66	1243.85	1244.55	1242.18	1244.55	1245.19	1243.36	1245.19
01/31/19	1238.33	1241.81	1241.43	1238.67	1241.81	1242.52	1240.27	1242.52	1243.05	1240.32	1243.05
02/01/19	1238.46	1239.17	1240.29	1236.44	1239.17	1240.39	1237.97	1240.39	1240.71	1238.24	1240.71
02/02/19	1236.14	1239.01	1238.83	1236.34	1239.01	1239.76	1237.51	1239.76	1240.45	1237.74	1240.45
02/03/19	1237.02	1241.42	1240.56	1238.01	1241.42	1241.12	1239.40	1241.12	1242.18	1239.04	1242.18
02/04/19	1237.02	1241.42	1240.56	1238.01	1241.42	1241.12	1239.40	1241.12	1242.18	1239.04	1242.18
02/05/19	1238.04	1242.14	1241.61	1238.98	1242.14	1242.74	1240.38	1242.74	1243.27	1240.72	1243.27
02/06/19	1238.80	1242.83	1242.33	1239.77	1242.83	1243.72	1241.10	1243.72	1244.40	1241.47	1244.40
02/07/19	1236.87	1240.78	1240.59	1237.37	1240.78	1241.56	1239.15	1241.56	1242.25	1239.66	1242.25
02/08/19	1235.64	1239.69	1239.36	1236.18	1239.69	1240.39	1237.85	1240.39	1241.26	1238.35	1241.26
02/09/19	1235.03	1238.97	1238.78	1235.37	1238.97	1239.72	1237.26	1239.72	1240.51	1237.78	1240.51
02/10/19	1236.08	1239.99	1239.88	1236.96	1239.99	1240.77	1238.35	1240.77	1241.71	1238.67	1241.71
02/11/19	1235.72	1239.31	1239.55	1235.23	1239.31	1240.29	1237.84	1240.29	1241.09	1237.70	1241.09
02/12/19	1235.11	1238.87	1239.00	1234.68	1238.87	1239.70	1237.21	1239.70	1240.55	1237.29	1240.55
02/13/19	1237.04	1240.82	1240.86	1237.49	1240.82	1241.74	1239.21	1241.74	1242.48	1239.40	1242.48
02/14/19	1238.65	1242.65	1242.44	1239.23	1242.65	1243.36	1240.74	1243.36	1244.01	1241.10	1244.01

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	PW-09 (R-05)	O-04	PW-10 (R-06)	O-04	O-05	PW-11 (R-07)	O-05	O-06	PW-12 (R-08)	O-06	O-07
01/01/19	1237.69	1244.35	1238.49	1244.35	1243.91	1241.92	1243.91	1243.84	1241.59	1243.84	1244.30
01/02/19	1235.59	1241.69	1235.33	1241.69	1240.99	1239.63	1240.99	1240.71	#N/A	1240.71	1241.03
01/03/19	1237.04	1242.17	1236.29	1242.17	1241.42	1239.68	1241.42	1240.79	1236.28	1240.79	1241.11
01/04/19	1237.14	1244.08	1239.46	1244.08	1243.61	1241.14	1243.61	1243.08	1239.85	1243.08	1243.68
01/05/19	1239.75	1245.76	1241.21	1245.76	1245.08	1242.20	1245.08	1244.58	1241.49	1244.58	1245.13
01/06/19	1240.47	1245.92	1241.60	1245.92	1245.36	1242.47	1245.36	1244.84	1241.78	1244.84	1245.54
01/07/19	1240.47	1245.92	1241.60	1245.92	1245.36	1242.47	1245.36	1244.84	1241.78	1244.84	1245.54
01/08/19	1240.71	1246.02	1241.67	1246.02	1245.47	1242.57	1245.47	1244.94	1241.83	1244.94	1245.69
01/09/19	1242.86	1247.64	1243.06	1247.64	1246.77	1243.61	1246.77	1246.34	1243.05	1246.34	1246.81
01/10/19	1243.03	1246.91	1242.49	1246.91	1246.19	1243.29	1246.19	1245.71	1242.36	1245.71	1246.15
01/11/19	1246.03	1249.23	1244.96	1249.23	1248.46	1245.45	1248.46	1247.84	1244.69	1247.84	1248.34
01/12/19	1246.66	1249.65	1245.55	1249.65	1248.86	1246.02	1248.86	1248.32	1245.23	1248.32	1248.85
01/13/19	1246.70	1249.69	1245.59	1249.69	1248.93	1246.06	1248.93	1248.40	1245.26	1248.40	1248.92
01/14/19	1246.70	1249.84	1245.62	1249.84	1248.89	1246.08	1248.89	1248.61	1245.37	1248.61	1248.83
01/15/19	1246.30	1249.43	1245.06	1249.43	1248.44	1245.47	1248.44	1247.79	1244.50	1247.79	1248.29
01/16/19	1245.15	1248.25	1243.96	1248.25	1247.37	1244.44	1247.37	1246.85	1243.45	1246.85	1247.30
01/17/19	1243.08	1246.24	1241.96	1246.24	1245.32	1242.45	1245.32	1244.89	1241.45	1244.89	1245.36
01/18/19	1243.27	1245.63	1241.85	1245.63	1244.65	1241.79	1244.65	1244.16	1240.77	1244.16	1244.67
01/19/19	1243.44	1245.36	1241.79	1245.36	1244.39	1241.54	1244.39	1244.44	1240.77	1244.44	1244.34
01/20/19	1243.54	1245.35	1241.69	1245.35	1244.37	1241.71	1244.37	1243.91	1240.39	1243.91	1244.39
01/21/19	1244.16	1245.93	1242.54	1245.93	1245.16	1242.21	1245.16	1244.65	1241.13	1244.65	1245.15
01/22/19	1244.59	1246.18	1242.88	1246.18	1245.48	1242.57	1245.48	1244.81	1241.49	1244.81	1245.49
01/23/19	1244.51	1246.44	1242.79	1246.44	1245.32	1242.49	1245.32	1244.96	1241.47	1244.96	1245.39
01/24/19	1244.47	1246.39	1242.86	1246.39	1245.37	1242.48	1245.37	1244.96	1241.43	1244.96	1245.35
01/25/19	1244.87	1246.80	1243.12	1246.80	1245.84	1242.82	1245.84	1245.28	1241.76	1245.28	1245.77
01/26/19	1245.30	1247.23	1243.57	1247.23	1246.20	1243.24	1246.20	1245.80	1242.42	1245.80	1246.26
01/27/19	1245.68	1247.53	1244.04	1247.53	1246.55	1243.60	1246.55	1246.06	1242.49	1246.06	1246.55
01/28/19	1244.45	1246.49	1242.79	1246.49	1245.49	1242.55	1245.49	1244.98	1241.38	1244.98	1245.43
01/29/19	1244.57	1246.56	1242.94	1246.56	1245.58	1242.66	1245.58	1245.15	1241.43	1245.15	1245.56
01/30/19	1242.75	1244.11	1240.67	1244.11	1243.24	1240.50	1243.24	1242.95	1239.17	1242.95	1243.43
01/31/19	1240.09	1241.92	1238.67	1241.92	1241.18	1238.39	1241.18	1240.93	1237.17	1240.93	1241.43
02/01/19	1237.78	1239.88	1231.89	1239.88	1239.96	#N/A	1239.96	1240.07	#N/A	1240.07	1240.29
02/02/19	1237.12	1239.13	1233.42	1239.13	1238.28	1235.94	1238.28	1238.26	#N/A	1238.26	1238.83
02/03/19	1239.58	1241.59	1239.53	1241.59	1241.00	1237.62	1241.00	1240.49	1235.41	1240.49	1240.56
02/04/19	1239.58	1241.59	1239.53	1241.59	1241.00	1237.62	1241.00	1240.49	1235.41	1240.49	1240.56
02/05/19	1240.55	1242.57	1239.10	1242.57	1241.68	1239.59	1241.68	1241.26	1236.18	1241.26	1241.61
02/06/19	1241.33	1243.27	1239.95	1243.27	1242.48	1239.51	1242.48	1242.25	1237.51	1242.25	1242.33
02/07/19	1239.45	1241.41	1238.07	1241.41	1240.81	1238.01	1240.81	1240.64	1235.57	1240.64	1240.59
02/08/19	1238.03	1240.10	1236.80	1240.10	1239.40	1236.74	1239.40	1239.19	1234.27	1239.19	1239.36
02/09/19	1237.44	1239.60	1236.59	1239.60	1238.83	1236.15	1238.83	1238.66	1233.87	1238.66	1238.78
02/10/19	1238.38	1240.73	1237.30	1240.73	1239.95	1237.29	1239.95	1239.67	1234.60	1239.67	1239.88
02/11/19	1237.85	1240.53	1236.86	1240.53	1240.26	1237.01	1240.26	1239.64	1234.17	1239.64	1239.55
02/12/19	1237.63	1239.97	1236.23	1239.97	1239.11	1236.37	1239.11	1238.93	1233.58	1238.93	1239.00
02/13/19	1239.46	1241.54	1237.16	1241.54	1241.02	1238.50	1241.02	1240.40	1235.53	1240.40	1240.86
02/14/19	1240.80	1243.14	1237.97	1243.14	1242.50	1240.24	1242.50	1242.22	1237.08	1242.22	1242.44

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	PW-05 (R-01)	O-01	O-07	PW-06 (R-02)	O-01	O-02	PW-07 (R-03)	O-02	O-03	PW-08 (R-04)	O-03
02/15/19	1240.80	1244.73	1244.68	1240.92	1244.73	1245.59	1243.28	1245.59	1246.40	1243.48	1246.40
02/16/19	1242.69	1246.59	1246.33	1242.66	1246.59	1247.40	1244.81	1247.40	1247.93	1244.95	1247.93
02/17/19	1243.00	1246.94	1246.85	1243.09	1246.94	1247.81	1245.20	1247.81	1248.59	1245.02	1248.59
02/18/19	1243.46	1247.69	1247.29	1244.83	1247.69	1248.32	1246.78	1248.32	1249.20	1247.11	1249.20
02/19/19	1245.84	1247.87	1247.77	1243.71	1247.87	1248.62	1246.01	1248.62	1249.37	1246.52	1249.37
02/20/19	1245.86	1247.78	1247.26	1246.12	1247.78	1248.17	1241.22	1248.17	1247.16	1241.02	1247.16
02/21/19	1242.63	1247.19	1246.94	1246.61	1247.19	1248.00	1241.06	1248.00	1247.56	1242.29	1247.56
02/22/19	1242.76	1248.17	1247.78	1245.27	1248.17	1248.99	1244.43	1248.99	1249.62	1245.94	1249.62
02/23/19	1243.56	1249.03	1248.50	1246.25	1249.03	1249.93	1246.62	1249.93	1250.75	1247.31	1250.75
02/24/19	1244.29	1249.91	1249.22	1247.20	1249.91	1250.90	1248.80	1250.90	1251.94	1248.48	1251.94
02/25/19	1245.10	1250.83	1249.93	1248.07	1250.83	1251.71	1249.30	1251.71	1252.41	1248.81	1252.41
02/26/19	1242.04	1250.81	1249.36	1247.62	1250.81	1251.76	1249.72	1251.76	1252.86	1249.86	1252.86
02/27/19	1241.97	1250.93	1249.30	1247.86	1250.93	1252.07	1250.21	1252.07	1253.19	1250.05	1253.19
02/28/19	1247.29	1251.17	1250.79	1248.23	1251.17	1251.27	1247.28	1251.27	1250.49	1247.44	1250.49
03/01/19	1249.46	1251.34	1251.85	1248.07	1251.34	1250.77	1245.21	1250.77	1248.67	1245.83	1248.67
03/02/19	1246.45	1251.93	1251.48	1248.69	1251.93	1252.32	1248.97	1252.32	1252.22	1248.56	1252.22
03/03/19	1246.83	1252.24	1251.83	1249.06	1252.24	1252.67	1249.27	1252.67	1252.51	1248.97	1252.51
03/04/19	1246.78	1250.81	1250.37	1248.62	1250.81	1251.87	1249.48	1251.87	1252.75	1250.09	1252.75
03/05/19	1245.18	1248.70	1249.01	1246.25	1248.70	1249.72	1247.11	1249.72	1251.62	#N/A	1251.62
03/06/19	1244.35	1249.68	1249.53	1245.24	1249.68	1250.18	1244.37	1250.18	1251.06	1248.81	1251.06
03/07/19	1246.07	1250.69	1250.08	1247.25	1250.69	1251.28	1246.32	1251.28	1251.76	1248.38	1251.76
03/08/19	1246.21	1250.70	1250.27	1248.15	1250.70	1251.57	1246.72	1251.57	1251.84	1248.55	1251.84
03/09/19	1246.05	1250.71	1249.99	1247.35	1250.71	1251.38	1246.56	1251.38	1251.88	1248.50	1251.88
03/10/19	1246.03	1250.65	1250.04	1247.35	1250.65	1251.28	1246.66	1251.28	1251.82	1248.54	1251.82
03/11/19	1246.91	1251.68	1250.88	1247.41	1251.68	1252.48	1247.42	1252.48	1253.37	1249.15	1253.37
03/12/19	1246.66	1251.30	1250.76	1246.23	1251.30	1251.91	1245.93	1251.91	1251.88	1244.36	1251.88
03/13/19	1246.27	1251.06	1250.61	1247.80	1251.06	1251.40	1246.09	1251.40	1250.94	1244.13	1250.94
03/14/19	1245.16	1249.79	1249.10	1246.41	1249.79	1250.39	1245.17	1250.39	1250.46	1243.11	1250.46
03/15/19	1241.96	1246.78	1245.94	1243.52	1246.78	1247.59	1243.09	1247.59	1248.58	1244.99	1248.58
03/16/19	1242.20	1246.94	1246.28	1243.55	1246.94	1247.63	1242.93	1247.63	1248.46	1244.77	1248.46
03/17/19	1240.40	1245.15	1244.51	1241.75	1245.15	1245.84	1240.84	1245.84	1246.56	1242.89	1246.56
03/18/19	1239.37	1244.14	1243.38	1240.89	1244.14	1244.78	1239.72	1244.78	1245.14	1241.65	1245.14
03/19/19	1239.11	1244.86	1243.78	1241.64	1244.86	1245.57	1238.84	1245.57	1245.91	1241.55	1245.91
03/20/19	1238.23	1243.05	1242.19	1239.14	1243.05	1243.62	1238.85	1243.62	1244.30	1240.51	1244.30
03/21/19	1237.41	1241.57	1240.69	1237.40	1241.57	1242.07	1237.27	1242.07	1242.66	1238.88	1242.66
03/22/19	1235.06	1239.89	1239.12	1235.54	1239.89	1240.39	1235.55	1240.39	1240.89	1237.19	1240.89
03/23/19	1234.53	1239.37	1238.63	1235.03	1239.37	1239.84	1234.76	1239.84	1240.38	1236.64	1240.38
03/24/19	1234.38	1238.82	1237.95	1232.90	1238.82	1239.04	1234.00	1239.04	1239.37	1237.57	1239.37
03/25/19	1234.38	1238.82	1237.95	1232.90	1238.82	1239.04	1234.00	1239.04	1239.37	1237.57	1239.37
03/26/19	1235.75	1237.28	1237.16	1221.91	1237.28	1236.62	1231.45	1236.62	1234.12	1218.30	1234.12
03/27/19	1235.60	1237.29	1237.16	1224.22	1237.29	1237.04	1232.55	1237.04	1235.90	1224.64	1235.90
03/28/19	1235.16	1237.47	1237.18	1226.92	1237.47	1237.64	1230.42	1237.64	1238.11	1233.61	1238.11
03/29/19	1234.30	1236.30	1236.21	1224.99	1236.30	1236.42	1228.17	1236.42	1237.00	1232.55	1237.00
03/30/19	1234.04	1235.88	1235.79	1224.79	1235.88	1236.04	1228.70	1236.04	1236.86	1232.82	1236.86
03/31/19	1233.49	1235.70	1235.52	1224.38	1235.70	1235.95	1228.64	1235.95	1236.95	1233.32	1236.95

All measurements in elevation above mean sea level.

#N/A or NM = Not measured or otherwise not available

No data were available for the following dates/wells:

1/2/19 R-08 (PW-12) was pulled for diagnosis/repair.

2/1/19 R-07 (PW-11) and R-08 (PW-12) pulled for Temperature logging.

2/1-2/2/19 R-08 (PW-12) pulled for Temperature logging.

3/5/19 R-04 (PW-08) pulled for Temperature logging.

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	PW-09 (R-05)	O-04	PW-10 (R-06)	O-04	O-05	PW-11 (R-07)	O-05	O-06	PW-12 (R-08)	O-06	O-07
02/15/19	1243.27	1245.67	1240.26	1245.67	1244.93	1242.58	1244.93	1244.61	1239.37	1244.61	1244.68
02/16/19	1245.08	1247.44	1242.04	1247.44	1246.69	1244.22	1246.69	1246.18	1240.91	1246.18	1246.33
02/17/19	1245.54	1247.94	1242.47	1247.94	1247.17	1244.57	1247.17	1246.71	1241.30	1246.71	1246.85
02/18/19	1247.09	1248.83	1242.93	1248.83	1247.68	1244.32	1247.68	1247.17	1241.67	1247.17	1247.29
02/19/19	1246.32	1248.68	1243.08	1248.68	1247.86	1245.29	1247.86	1247.47	1241.69	1247.47	1247.77
02/20/19	1238.90	1247.27	1242.13	1247.27	1247.06	1245.17	1247.06	1247.03	1241.50	1247.03	1247.26
02/21/19	1240.48	1247.58	1243.55	1247.58	1247.22	1245.13	1247.22	1246.95	1242.04	1246.95	1246.94
02/22/19	1244.51	1248.79	1244.29	1248.79	1248.09	1245.65	1248.09	1247.66	1242.78	1247.66	1247.78
02/23/19	1245.51	1249.49	1244.12	1249.49	1248.75	1246.32	1248.75	1248.33	1243.36	1248.33	1248.50
02/24/19	1246.45	1250.23	1243.92	1250.23	1249.40	1247.02	1249.40	1248.98	1244.15	1248.98	1249.22
02/25/19	1246.81	1250.61	1244.64	1250.61	1249.89	1247.43	1249.89	1249.51	1244.83	1249.51	1249.93
02/26/19	1245.37	1249.84	1238.36	1249.84	1248.79	1245.46	1248.79	1248.52	1240.77	1248.52	1249.36
02/27/19	1245.49	1249.87	1238.18	1249.87	1248.74	1245.32	1248.74	1248.41	1240.57	1248.41	1249.30
02/28/19	1246.54	1250.78	1245.59	1250.78	1250.60	1248.43	1250.60	1250.54	1246.79	1250.54	1250.79
03/01/19	1246.45	1251.18	1248.50	1251.18	1251.83	1,250.80	1251.83	1251.93	1,249.06	1251.93	1251.85
03/02/19	1247.47	1251.80	1245.71	1251.80	1251.36	1249.17	1251.36	1251.23	1,246.29	1251.23	1251.48
03/03/19	1247.72	1252.07	1245.99	1252.07	1251.67	1249.55	1251.67	1251.54	1246.57	1251.54	1251.83
03/04/19	1248.70	1251.67	1246.70	1251.67	1250.94	1249.10	1250.94	1250.26	1246.62	1250.26	1250.37
03/05/19	1248.81	1250.53	1247.48	1250.53	1249.73	1247.84	1249.73	1248.93	1246.22	1248.93	1249.01
03/06/19	1246.57	1250.34	1244.01	1250.34	1249.64	1247.38	1249.64	1249.35	1244.06	1249.35	1249.53
03/07/19	1247.12	1250.81	1244.18	1250.81	1250.10	1247.72	1250.10	1249.69	1244.17	1249.69	1250.08
03/08/19	1247.11	1250.93	1244.29	1250.93	1250.26	1247.21	1250.26	1249.88	1245.07	1249.88	1250.27
03/09/19	1246.98	1250.80	1244.03	1250.80	1250.33	1247.61	1250.33	1249.63	1243.97	1249.63	1249.99
03/10/19	1246.94	1250.70	1243.93	1250.70	1250.07	1247.65	1250.07	1249.35	1243.92	1249.35	1250.04
03/11/19	1247.91	1251.58	1244.70	1251.58	1250.88	1248.44	1250.88	1250.47	1244.81	1250.47	1250.88
03/12/19	1242.11	1251.39	1244.51	1251.39	1250.97	1248.48	1250.97	1250.41	1244.55	1250.41	1250.76
03/13/19	1240.01	1251.12	1245.14	1251.12	1250.47	1248.11	1250.47	1250.15	1244.67	1250.15	1250.61
03/14/19	1244.60	1250.07	1242.50	1250.07	1248.95	1246.47	1248.95	1248.52	1242.77	1248.52	1249.10
03/15/19	1242.97	1246.64	1238.89	1246.64	1245.35	1242.87	1245.35	1245.00	1239.24	1245.00	1245.94
03/16/19	1243.00	1246.94	1239.64	1246.94	1246.22	1243.78	1246.22	1245.88	1239.80	1245.88	1246.28
03/17/19	1240.97	1245.55	1237.66	1245.55	1244.21	1241.85	1244.21	1243.96	1237.89	1243.96	1244.51
03/18/19	1239.62	1243.91	1236.56	1243.91	1242.97	1240.65	1242.97	1242.78	1238.19	1242.78	1243.38
03/19/19	1239.51	1244.38	1237.42	1244.38	1243.86	1241.10	1243.86	1243.07	1237.11	1243.07	1243.78
03/20/19	1238.64	1242.58	1235.14	1242.58	1241.94	1239.61	1241.94	1241.69	1235.64	1241.69	1242.19
03/21/19	1236.94	1240.85	1233.31	1240.85	1240.17	1237.65	1240.17	1240.02	1234.07	1240.02	1240.69
03/22/19	1235.16	1238.79	1232.65	1238.79	1238.56	1235.68	1238.56	1237.98	1234.71	1237.98	1239.12
03/23/19	1234.61	1238.21	1232.03	1238.21	1238.00	1235.12	1238.00	1237.49	1234.17	1237.49	1238.63
03/24/19	1233.18	1237.07	1230.94	1237.07	1237.12	1234.32	1237.12	1236.70	1232.93	1236.70	1237.95
03/25/19	1233.18	1237.07	1230.94	1237.07	1237.12	1234.32	1237.12	1236.70	1232.93	1236.70	1237.95
03/26/19	1231.79	1234.71	1216.32	1234.71	1235.15	1233.20	1235.15	1235.54	1226.87	1235.54	1237.16
03/27/19	1232.58	1235.46	1221.84	1235.46	1235.65	1233.42	1235.65	1235.69	1229.69	1235.69	1237.16
03/28/19	1234.25	1236.66	1230.77	1236.66	1236.55	1234.03	1236.55	1235.98	1229.55	1235.98	1237.18
03/29/19	1233.30	1235.84	1229.81	1235.84	1235.69	1232.97	1235.69	1234.95	1228.42	1234.95	1236.21
03/30/19	1233.65	1235.63	1229.91	1235.63	1235.38	1232.74	1235.38	1234.64	1228.26	1234.64	1235.79
03/31/19	1233.52	1235.44	1229.52	1235.44	1235.17	1232.51	1235.17	1234.39	1227.86	1234.39	1235.52

All measurements in elevation above mean sea level.

#N/A or NM = Not measured or otherwise not available

No data were available for the following dates/wells:

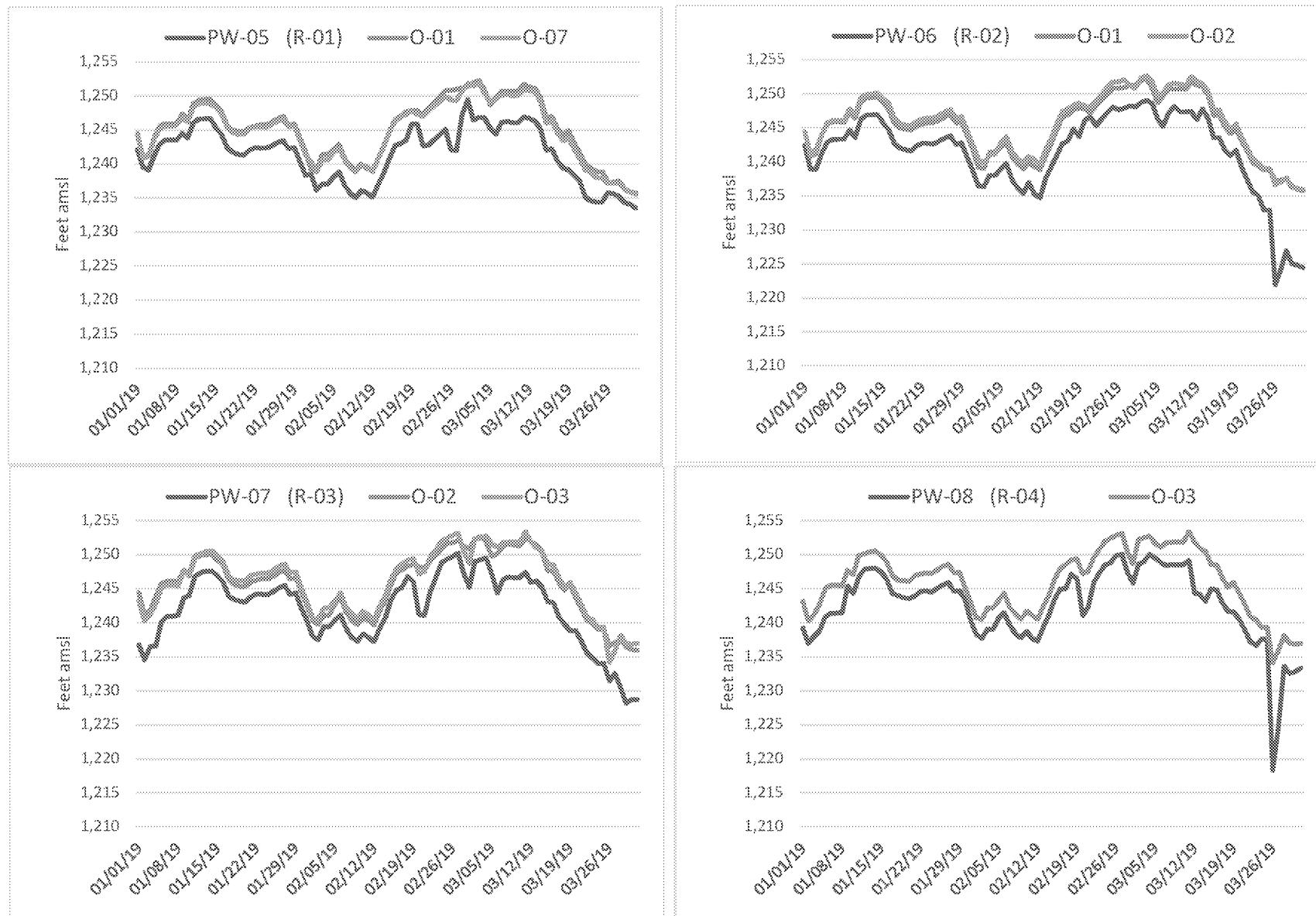
1/2/19 R-08 (PW-12) was pulled for diagnosis/repair.

2/1/19 R-07 (PW-11) and R-08 (PW-12) pulled for Temperature logging.

2/1-2/2/19 R-08 (PW-12) pulled for Temperature logging.

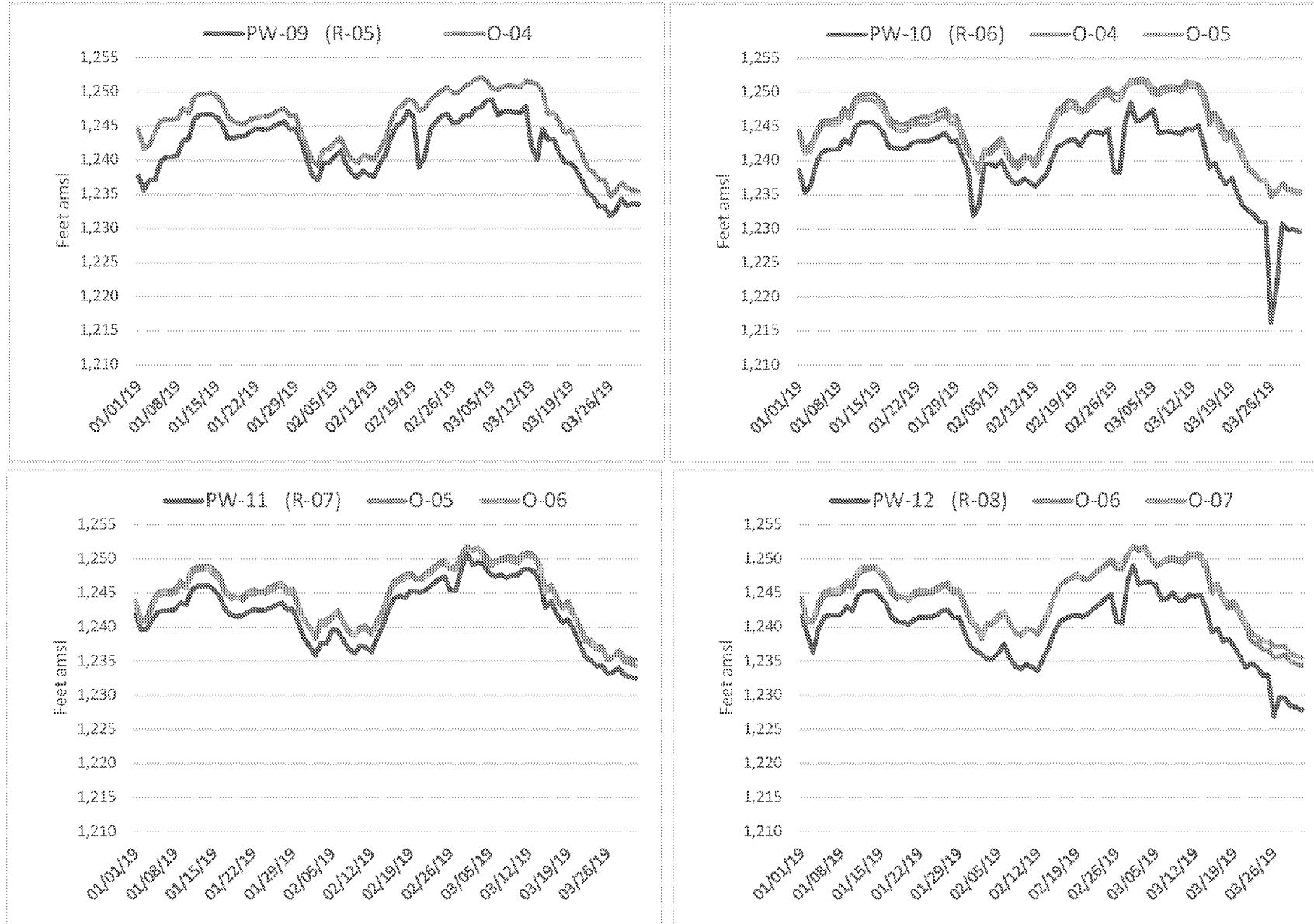
3/5/19 R-04 (PW-08) pulled for Temperature logging.

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells



On 3/26, recovery wells R-02 (PW-06), R-04 (PW-08), R-06 (PW-10) and R-08 (PW-12) were pumped at 45 gpm while center recovery well R-09 (PW-13) was removed for temperature survey logging in accordance to UIC Permit required Mechanical Integrity Testing. The resultant drawdown in these wells as shown on the table and graphs is correct.

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells



ATTACHMENT C

**Summary of Bulk Conductivity Monitoring Results
First Quarter 2019 Memorandum dated April 26, 2019**



HALEY & ALDRICH, INC.
One Arizona Center
400 E. Van Buren St., Suite 545
Phoenix, AZ 85004
602.760.2450

MEMORANDUM

26 April 2019
File No. 132473-003

TO: Florence Copper Inc.
Mr. Dan Johnson V.P., General Manager

C: Florence Copper Inc.
Mr. Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Mark Nicholls, R.G.

SUBJECT: Summary of Bulk Conductivity Monitoring Results, First Quarter 2019
Production Test Facility
Florence Copper, Florence, Arizona

Haley & Aldrich, Inc. (Haley & Aldrich) has conducted statistical analysis of bulk electrical conductivity data collected by HydroGeophysics, Inc. at the Production Test Facility (PTF) located in Florence, Arizona, in accordance with Temporary Aquifer Protection Permit (APP) No. 106360 and the Underground Injection Control (UIC) Permit No R9UIC-AZ3-FR11-1. The procedures used to complete the analysis were described in the document titled *Procedures for Determining Bulk Electrical Conductivity Alert Levels* (Haley & Aldrich, 2018)¹. The alert levels (ALs) for bulk electrical conductivity were approved in the letter issued by the U.S. Environmental Protection Agency dated 14 December 2018 and were adopted into the APP issued by the Arizona Department of Environmental Quality on 5 December 2018.

Alert Levels

To ensure that In-Situ Copper Recovery fluids do not enter the lower basin-fill unit from the bedrock oxide unit, the three upper horizons (1 through 3) are monitored. The following ALs were established for these horizons:

Electrode Pair Horizon	Proposed Alert Level (ohm-meters)
Horizon 1	9.93
Horizon 2	10.12
Horizon 3	10.33

¹ Haley & Aldrich, Inc., 2018. *Procedures for Determining Bulk Electrical Conductivity Alert Levels, Production Test Facility, Florence Copper Project*. August.

The ALs represent minimum values, if the measured apparent resistivity in one of these horizons is *lower* than the established AL on three adjacent or intersecting current paths, this constitutes an exceedance.

First Quarter 2019 Monitoring Results

First quarter (Q1) 2019 includes 13 weekly monitoring events for bulk electrical conductivity between 3 January and 28 March. No AL exceedances occurred during the monitoring period.

One current path in the uppermost horizon yielded a conductivity value that was below the AL for one monitoring event. The value could not be reproduced during subsequent monitoring and is therefore attributed to instrument drift or electronic noise, and is considered to be an outlier. The low value occurred in Horizon 1, 40 feet above the lower basin fill unit/oxide contact, on 6 March 2019, between sending well O-05 and receiving well O-06. The recorded exceedance value was 9.91 ohm-meters ($\Omega\text{-m}$). This value is 0.02 $\Omega\text{-m}$ below the established 9.93 $\Omega\text{-m}$ alert level. Linear contour maps for the monitoring period detail these results (Figures 1 through 13).

Data Summary

Tables 1 through 3 list the apparent resistivity results over this monitoring period for Horizons 1 through 3, respectively.

Relative to the baseline dataset, one outlier was detected on these monitoring dates (defined as values over 4 times the interquartile range outside the range around the data median). However, the grouped data from each horizon fall within the range of the baseline dataset (Attachment A).

Attachment B shows the data from each horizon over time, during the baseline period, and monitoring both before and after the PTF became operational. The data collected during Q1 is within the established tolerance limits.

Enclosures:

- Table 1 – Bulk Electrical Conductivity Monitoring Results, Horizon 1 (40 Feet Above LBFU/Oxide Contact)
- Table 2 – Bulk Electrical Conductivity Monitoring Results, Horizon 2 (20 Feet Above LBFU/Oxide Contact)
- Table 3 – Bulk Electrical Conductivity Monitoring Results, Horizon 3 (at LBFU/Oxide Contact)
- Figure 1 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 01/03/2019, Production Test Facility
- Figure 2 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 01/11/2019, Production Test Facility
- Figure 3 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 01/17/2019, Production Test Facility
- Figure 4 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 01/24/2019, Production Test Facility
- Figure 5 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 01/31/2019, Production Test Facility
- Figure 6 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 02/08/2019, Production Test Facility
- Figure 7 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 02/14/2019, Production Test Facility
- Figure 8 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 02/21/2019, Production Test Facility
- Figure 9 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 02/28/2019, Production Test Facility
- Figure 10 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 03/06/2019, Production Test Facility
- Figure 11 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 03/14/2019, Production Test Facility
- Figure 12 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 03/21/2019, Production Test Facility
- Figure 13 – Baseline Apparent Resistivity of Electrode Pairs by Horizon – 03/28/2019, Production Test Facility
- Attachment A – Box Diagrams for First Quarter Monitoring Data
- Attachment B – Summary Plot of Bulk Electrical Conductivity

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TABLES

TABLE 1

BULK ELECTRICAL CONDUCTIVITY MONITORING RESULTS

HORIZON 1 (40 FEET ABOVE LBFU/OXIDE CONTACT)

FLORENCE COPPER PROJECT

FLORENCE, ARIZONA

Electrode 1	Electrode 2	Sending Well	Receiving Well	Apparent Resistivity ($\Omega\text{-m}$)												
				1/3/2019	1/11/2019	1/17/2019	1/24/2019	1/31/2019	2/8/2019	2/14/2019	2/21/2019	2/28/2019	3/6/2019	3/14/2019	3/21/2019	3/28/2019
B-01-BC-01	B-02-BC-01	O-01	O-02	13.02	12.89	12.92	12.93	12.93	12.91	12.89	12.92	12.85	12.85	12.83	12.85	12.87
B-01-BC-01	B-03-BC1-02	O-01	O-03	11.72	11.45	11.45	11.58	11.58	11.45	11.44	11.47	11.39	11.34	11.37	11.37	11.40
B-01-BC-01	B-04-BC-01	O-01	O-04	13.85	13.53	13.49	13.83	13.83	13.52	13.52	13.54	13.42	13.34	13.41	13.44	13.45
B-01-BC-01	B-05-BC-01	O-01	O-05	12.75	12.46	12.44	12.52	12.52	12.43	12.45	12.46	12.37	12.23	12.33	12.38	12.39
B-01-BC-01	B-06-BC-01	O-01	O-06	12.16	11.93	11.92	11.90	11.90	11.93	11.93	11.92	11.87	11.78	11.81	11.86	11.87
B-01-BC-01	B-07-BC1-02	O-01	O-07	12.06	11.89	11.88	11.84	11.84	11.90	11.90	11.90	11.86	11.82	11.83	11.85	11.86
B-02-BC-01	B-03-BC1-02	O-02	O-03	10.75	10.59	10.58	10.70	10.70	10.57	10.58	10.58	10.52	10.49	10.53	10.52	10.53
B-02-BC-01	B-04-BC-01	O-02	O-04	14.55	14.21	14.20	14.41	14.41	14.19	14.21	14.21	14.11	14.03	14.09	14.13	14.13
B-02-BC-01	B-05-BC-01	O-02	O-05	14.06	13.74	13.74	13.89	13.89	13.74	13.73	13.77	13.66	13.49	13.63	13.65	13.68
B-02-BC-01	B-06-BC-01	O-02	O-06	14.07	13.74	13.74	13.73	13.73	13.74	13.75	13.75	13.68	13.53	13.63	13.65	13.67
B-02-BC-01	B-07-BC1-02	O-02	O-07	12.82	12.57	12.57	12.71	12.71	12.58	12.58	12.58	12.53	12.46	12.47	12.50	12.52
B-03-BC1-02	B-04-BC-01	O-03	O-04	13.01	12.76	12.77	12.95	12.95	12.75	12.74	12.77	12.70	12.58	12.66	12.67	12.69
B-03-BC1-02	B-05-BC-01	O-03	O-05	13.49	13.21	13.19	13.20	13.20	13.19	13.19	13.21	13.13	12.96	13.08	13.11	13.12
B-03-BC1-02	B-06-BC-01	O-03	O-06	14.70	14.35	14.35	14.33	14.33	14.36	14.37	14.38	14.29	14.13	14.22	14.26	14.29
B-03-BC1-02	B-07-BC1-02	O-03	O-07	13.89	13.57	13.56	13.63	13.63	13.56	13.56	13.57	13.49	13.37	13.42	13.47	13.47
B-04-BC-01	B-05-BC-01	O-04	O-05	10.99	10.88	10.87	10.92	10.92	10.89	10.87	10.89	10.85	10.75	10.79	10.83	10.82
B-04-BC-01	B-06-BC-01	O-04	O-06	12.55	12.32	12.30	12.51	12.51	12.31	12.31	12.32	12.25	12.08	12.15	12.23	12.23
B-04-BC-01	B-07-BC1-02	O-04	O-07	13.26	12.98	12.94	13.00	13.00	12.97	12.97	12.98	12.89	12.75	12.81	12.86	12.90
B-05-BC-01	B-06-BC-01	O-05	O-06	10.28	10.12	10.12	10.07	10.07	10.13	10.12	10.13	10.08	9.91	9.97	10.05	10.06
B-05-BC-01	B-07-BC1-02	O-05	O-07	11.16	10.93	10.92	11.04	11.04	10.93	10.93	10.93	10.88	10.70	10.83	10.87	10.87
B-06-BC-01	B-07-BC1-02	O-06	O-07	10.20	10.09	10.10	10.19	10.19	10.10	10.11	10.10	10.07	10.01	10.05	10.06	10.07

Notes

 $\Omega\text{-m}$ = ohm-meters

LBFU = lower basin-fill unit

Oxide = bedrock oxide unit

TABLE 2

BULK ELECTRICAL CONDUCTIVITY MONITORING RESULTS

HORIZON 2 (20 FEET ABOVE LBFU/OXIDE CONTACT)

FLORENCE COPPER PROJECT

FLORENCE, ARIZONA

Electrode 1	Electrode 2	Sending Well	Receiving Well	Apparent Resistivity ($\Omega\text{-m}$)												
				1/3/2019	1/11/2019	1/17/2019	1/24/2019	1/31/2019	2/8/2019	2/14/2019	2/21/2019	2/28/2019	3/6/2019	3/14/2019	3/21/2019	3/28/2019
B-01-BC-02	B-02-BC-02	O-01	O-02	14.82	14.70	14.71	14.80	14.80	14.68	14.70	14.70	14.65	14.64	14.66	14.63	14.66
B-01-BC-02	B-03-BC1-04	O-01	O-03	11.79	11.53	11.53	11.58	11.58	11.51	11.53	11.53	11.45	11.43	11.46	11.46	11.48
B-01-BC-02	B-04-BC-02	O-01	O-04	13.71	13.38	13.40	13.23	13.23	13.38	13.38	13.40	13.29	13.20	13.31	13.29	13.33
B-01-BC-02	B-05-BC-02	O-01	O-05	12.57	12.29	12.27	12.52	12.52	12.28	12.29	12.28	12.19	12.07	12.17	12.21	12.24
B-01-BC-02	B-06-BC-02	O-01	O-06	12.01	11.79	11.78	11.91	11.91	11.78	11.78	11.79	11.72	11.63	11.66	11.71	11.73
B-01-BC-02	B-07-BC1-04	O-01	O-07	12.02	11.86	11.85	11.80	11.80	11.86	11.86	11.87	11.82	11.78	11.82	11.81	11.82
B-02-BC-02	B-03-BC1-04	O-02	O-03	11.45	11.27	11.26	11.26	11.26	11.24	11.25	11.26	11.20	11.16	11.21	11.19	11.20
B-02-BC-02	B-04-BC-02	O-02	O-04	14.62	14.27	14.26	14.41	14.41	14.27	14.26	14.27	14.17	14.07	14.15	14.17	14.20
B-02-BC-02	B-05-BC-02	O-02	O-05	14.07	13.76	13.75	13.89	13.89	13.75	13.77	13.77	13.66	13.53	13.60	13.69	13.71
B-02-BC-02	B-06-BC-02	O-02	O-06	14.09	13.76	13.75	13.74	13.74	13.76	13.77	13.78	13.68	13.56	13.65	13.69	13.70
B-02-BC-02	B-07-BC1-04	O-02	O-07	12.81	12.57	12.56	12.58	12.58	12.57	12.58	12.58	12.49	12.42	12.50	12.49	12.51
B-03-BC1-04	B-04-BC-02	O-03	O-04	13.00	12.74	12.74	12.95	12.95	12.73	12.74	12.75	12.68	12.58	12.66	12.65	12.66
B-03-BC1-04	B-05-BC-02	O-03	O-05	13.36	13.07	13.05	13.20	13.20	13.05	13.05	13.07	12.99	12.83	12.95	12.96	12.98
B-03-BC1-04	B-06-BC-02	O-03	O-06	14.55	14.21	14.22	14.33	14.33	14.22	14.23	14.23	14.13	14.00	14.11	14.11	14.13
B-03-BC1-04	B-07-BC1-04	O-03	O-07	13.63	13.31	13.31	13.60	13.60	13.30	13.30	13.32	13.23	13.13	13.16	13.23	13.23
B-04-BC-02	B-05-BC-02	O-04	O-05	11.34	11.23	11.23	11.30	11.30	11.24	11.22	11.24	11.20	11.12	11.13	11.17	11.19
B-04-BC-02	B-06-BC-02	O-04	O-06	12.55	12.30	12.30	12.51	12.51	12.30	12.29	12.30	12.24	12.07	12.12	12.21	12.22
B-04-BC-02	B-07-BC1-04	O-04	O-07	13.01	12.72	12.72	12.97	12.97	12.72	12.73	12.73	12.66	12.52	12.61	12.64	12.67
B-05-BC-02	B-06-BC-02	O-05	O-06	10.51	10.35	10.36	10.35	10.35	10.36	10.35	10.36	10.31	10.14	10.18	10.28	10.28
B-05-BC-02	B-07-BC1-04	O-05	O-07	10.98	10.76	10.76	11.01	11.01	10.76	10.75	10.75	10.71	10.53	10.59	10.70	10.70
B-06-BC-02	B-07-BC1-04	O-06	O-07	10.96	10.85	10.84	10.88	10.88	10.85	10.85	10.85	10.83	10.77	10.79	10.82	10.83

Notes

 $\Omega\text{-m}$ = ohm-meters

LBFU = lower basin-fill unit

Oxide = bedrock oxide unit

TABLE 3

BULK ELECTRICAL CONDUCTIVITY MONITORING RESULTS

HORIZON 3 (AT LBFU/OXIDE CONTACT)

FLORENCE COPPER PROJECT

FLORENCE, ARIZONA

Electrode 1	Electrode 2	Sending Well	Receiving Well	Apparent Resistivity ($\Omega\text{-m}$)												
				1/3/2019	1/11/2019	1/17/2019	1/24/2019	1/31/2019	2/8/2019	2/14/2019	2/21/2019	2/28/2019	3/6/2019	3/14/2019	3/21/2019	3/28/2019
B-01-BC-03	B-02-BC-03	O-01	O-02	15.71	15.59	15.60	15.53	15.71	15.55	15.58	15.56	15.52	15.52	15.56	15.50	15.52
B-01-BC-03	B-03-BC2-02	O-01	O-03	11.84	11.60	11.59	11.58	11.58	11.57	11.58	11.59	11.53	11.47	11.55	11.52	11.53
B-01-BC-03	B-04-BC-03	O-01	O-04	13.51	13.18	13.19	13.23	13.23	13.21	13.23	13.24	13.12	13.06	13.13	13.14	13.18
B-01-BC-03	B-05-BC-03	O-01	O-05	12.40	12.12	12.12	12.52	11.95	12.14	12.13	12.15	12.04	11.94	12.02	12.07	12.10
B-01-BC-03	B-06-BC-03	O-01	O-06	11.86	11.61	11.62	11.91	11.91	11.61	11.61	11.61	11.54	11.46	11.51	11.54	11.57
B-01-BC-03	B-07-BC2-02	O-01	O-07	12.26	12.11	12.10	12.09	12.09	12.10	12.09	12.10	12.05	12.01	12.06	12.05	12.06
B-02-BC-03	B-03-BC2-02	O-02	O-03	11.81	11.63	11.64	11.57	11.57	11.64	11.60	11.61	11.55	11.53	11.58	11.55	11.57
B-02-BC-03	B-04-BC-03	O-02	O-04	14.39	14.06	14.05	14.41	14.41	14.06	14.05	14.09	13.96	13.87	13.97	13.99	13.99
B-02-BC-03	B-05-BC-03	O-02	O-05	13.87	13.54	13.53	13.90	13.90	13.54	13.55	13.58	13.45	13.32	13.43	13.47	13.50
B-02-BC-03	B-06-BC-03	O-02	O-06	13.92	13.59	13.59	13.75	13.75	13.58	13.60	13.62	13.51	13.39	13.47	13.51	13.53
B-02-BC-03	B-07-BC2-02	O-02	O-07	12.88	12.63	12.61	12.59	12.59	12.62	12.62	12.62	12.55	12.51	12.55	12.55	12.58
B-03-BC2-02	B-04-BC-03	O-03	O-04	12.92	12.68	12.65	12.95	12.95	12.64	12.64	12.68	12.59	12.51	12.58	12.58	12.59
B-03-BC2-02	B-05-BC-03	O-03	O-05	13.30	13.03	13.01	13.20	13.20	12.98	13.02	13.03	12.94	12.79	12.87	12.93	12.94
B-03-BC2-02	B-06-BC-03	O-03	O-06	14.58	14.22	14.20	14.33	14.33	14.20	14.23	14.25	14.13	13.99	14.10	14.12	14.14
B-03-BC2-02	B-07-BC2-02	O-03	O-07	13.57	13.27	13.24	13.60	13.60	13.23	13.25	13.27	13.20	13.06	13.14	13.18	13.19
B-04-BC-03	B-05-BC-03	O-04	O-05	12.08	11.97	11.97	12.07	12.07	11.95	11.95	11.95	11.93	11.84	11.86	11.92	11.90
B-04-BC-03	B-06-BC-03	O-04	O-06	12.64	12.41	12.40	12.51	12.51	12.39	12.38	12.39	12.33	12.16	12.23	12.30	12.30
B-04-BC-03	B-07-BC2-02	O-04	O-07	12.86	12.56	12.55	12.43	12.43	12.55	12.58	12.59	12.49	12.35	12.45	12.49	12.52
B-05-BC-03	B-06-BC-03	O-05	O-06	10.78	10.63	10.63	10.62	10.62	10.64	10.62	10.62	10.58	10.42	10.49	10.54	10.56
B-05-BC-03	B-07-BC2-02	O-05	O-07	10.83	10.61	10.60	10.59	10.59	10.62	10.60	10.59	10.55	10.42	10.47	10.54	10.56
B-06-BC-03	B-07-BC2-02	O-06	O-07	11.16	11.06	11.06	11.06	11.06	11.06	11.06	11.05	11.03	10.97	10.97	11.02	11.04

Notes

 $\Omega\text{-m}$ = ohm-meters

LBFU = lower basin-fill unit

Oxide = bedrock oxide unit

FIGURES

